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EARTHQUAKES IN SOUTHERN CALIFORNIA

1979-1989

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The Imperial Valley Earthquake of October 15, 1979.
Epicenter 32.6°N, 115.3°W; depth: 7 km; magnitude 6.8; damage: $30 million; no deaths.

The earthquake was felt over approximately 128,000 sq km. The worst damage occurred in southern Imperial County and northeastern Baja California where eleven businesses and two homes were destroyed. Four hundred forty businesses and 1565 homes were damaged. Although there were no deaths, ninety-one people were reported injured mainly by flying glass or by falling objects. The greatest single structural loss was to the Imperial County Services Building in El Centro. Non-structural damage included damage to bridge abutments that were cracked and roadbeds that shifted due to slumping or faulting. The agriculture industry incurred damage to canals and irrigation ditches, damage to subsurface drain tiles which were disturbed by the movement along the Imperial Fault. The worst damage incurred by the agriculture industry was to the All-American Canal which brings Colorado River water into the Imperial Valley. Ground shaking caused the collapse of levees on both sides of the canal along a 13-km stretch of the canal east of Calexico. Extensive lateral slope failure occurred along this and other canals. In some places canal banks settled by more than 1 m.

The Westmorland Earthquake of April 26, 1981.
Epicenter 33.1°N, 115.6°W; depth: 4 km; magnitude 6.3 ML(B); damage: $1-3 million; no deaths.

Twelve buildings in Westmorland were severely damaged, ten beyond repair, and an additional 30 sustained minor damage. Seventy percent of the town's 900 homes (many of which were built of adobe and brick) were damaged, and five homes were condemned. Six mobile homes were knocked off their foundations and nine homes sustained minor damage to foundations, porches, and walls. Electrical service was interrupted for one hour and the water supply was interrupted for 10 hours. The sewage plant sustained an estimated $40,000 damage. Total damage was estimated at $1.5 million. Subsidence was reported on several rural roads in the area. Liquefaction caused scores of "mudpots," and oozing soil in nearby fields. One country road west of Westmorland collapsed, producing a 2-foot drop-off. In rural areas $100,000 in damages was incurred when unreinforced, concrete-lined irrigation canals were broken.

The Palm Springs Earthquake of July 8, 1986.
Epicenter 34.0°N, 116.6°W; depth: 10 km; magnitude 6.0; damage: $4.5 million; no deaths.

At least 29 people were injured and some damage occurred in the Palm Springs-Morongo Valley area. Landslides occurred in the area. The quake caused serious damage at the Devers substation of Southern California Edison Company. Some residences in the Whitewater Canyon area were badly damaged. Damage from this quake was approximately $4.5 million. Minor damage occurred at Angelus Oaks, Desert Hot Springs, North Palm Springs, Palm Desert, Palm Springs, and Yucca Valley. The quake was felt throughout much of southern California and in Las Vegas, Nevada, Lake Havasu City, Arizona and in the northern Baja California area of the United States and Mexico.

The Whittier Narrows Earthquake of October 1, 1987.
Epicenter 34.0°N, 118.1°W; depth: 11 km; magnitude 5.9; damage: $358 million; 8 deaths.

At 7:42 A. M. (Pacific Daylight Time), on October 1, 1987, a fault located about 11 km below the surface and 20 km east of downtown Los Angeles, California, began to rupture. The fault was an extension of the previously identified Whittier fault. The resulting earthquake (magnitude 6.1 on the Richter scale) caused about $358 million in property damage and the loss of 8 lives. Severe damage was confined mainly to communities east of Los Angeles and near the epicenter. No severe structural damage to high-rise structures in downtown Los Angeles was reported. Non-structural damage did occur, however. In Whittier the most severe damage occurred in the "Uptown" business district. Similar damage was observed in the old downtown section of Alhambra and in the "Old Town" section of Pasadena. These areas had high concentrations of unreinforced masonry buildings. Residences which sustained damage usually were constructed of masonry, were not fully anchored to foundations, or were houses built over garages with large door openings. Many chimneys collapsed and in some cases, fell through roofs. Wood frame residences sustained relatively little damage. Damage often occurred around large windows. Light fixtures and suspended ceilings fell in many buildings within a 10-km radius of the epicenter. A student at California State University, Los Angeles was killed when the connectors for a precast concrete fascia panel failed and the panel fell two stories crushing her. Damage was incurred on a bridge at the interchange of I-605 and I-5, where the columns in the center were severely damaged.

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